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11048P1 GB/CB

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3. Full name, address and postcode of the or of each applicant (underline all surnames)

Reckitt Benckiser (UK) Limited
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797 2136002

Patents ADP number (if you know it)

If the applicant is a corporate body, give the
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England

4. Title of the invention

Article and Method

5. Name of your agent (if you have one)

John C. McKnight

"Address for service" in the United Kingdom
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Reckitt Benckiser plc
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Country

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Date of filing

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Claim(s)

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Any other documents (please specify)

FS2 ✓

11.

I/We request the grant of a patent on the basis of this application.

Signature

Date

Craig M. Bowers

21 June 2002

12. Name and daytime telephone number of Person to contact in the United Kingdom

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ARTICLE AND METHOD

The present invention relates to wipes for cleaning a surface, leaving a water-resistant layer. In particular
5 it relates to a sheet material - a wipe - which is impregnated with a cleaning composition which reduces or prevents the formation of water stains.

It is known that if aqueous liquid compositions
10 (hereinafter collectively called "water" for convenience), collect on wooden surfaces, especially certain lacquered or varnished wooden surfaces, it may cause water staining. The water staining may be in the form of white rings. Consequently, any water on such surfaces is generally
15 removed as soon as possible. However, if the water has contacted the surface for too long, water staining may occur. Once it has occurred it is known to try to mask, reduce or remove it, using specialist procedures or chemical agents. Drastic measures may sometimes be
20 undertaken, for example, removing the stained region and exposing fresh unstained material beneath, then restoring any surface coating. If chemical agents are used to mask or remove the staining, the chemical agents may be toxic and environmentally unsafe, and frequently the masking or
25 stain removal is not complete.

Commercially available cleaning compositions are not
perceived to prevent water staining and there are
indications that some may even promote water staining.

30 It is preferable to prevent staining of a surface caused by contact with water, than to seek to cure the problem when it arises. It is desirable to do this in a way which

does not mask the appearance of the surface (frequently an item of furniture, for example a table, desk, chest or shelf).

5 According to a first aspect of the present invention there is provided a moist wipe for cleaning a surface, the wipe comprising a sheet material pre-moistened with a liquid composition comprising a wax.

10 By "wax" we mean a water-repellent low-melting organic material useful in laying down a stable inert coating on a surface. Suitable waxes include hydrocarbons and esters of fatty acids and alcohols.

15 By "pre-moistened" we mean that the wipe is moistened not immediately prior to its use in cleaning a surface. Generally the wipe is "pre-moistened" as part of its manufacture. Moistening a cleaning cloth during cleaning is not a "pre-moistened wipe" in accordance with this
20 invention.

In use, the target surface is contacted with the moist wipe, which is drawn across the surface. It thereby cleans the surface and lays down wax onto the surface.

25 The wax inhibits the formation of water stains on the surface if water is subsequently contacted with the surface.

30 Suitably the wax is present as an emulsion in the liquid composition. Good results have been obtained in a non-ionic aqueous emulsion.

3.

Particularly preferred as a wax in the invention is paraffin wax.

Paraffin waxes generally have a macrocrystalline structure and consist largely of n-alkanes of formula $C_{20}H_{42}$ and upwards, with some iso- and cycloalkanes.

Suitably the wax is present in the composition in an amount of between 0.01% to 10% wt, preferably 0.05% to 5%, and more preferably 0.1% to 3%, and most preferably 0.1% to 1%, by weight of the total weight of the liquid composition.

Suitably the liquid composition is an aqueous composition that includes water in an amount of 50% to 98%, preferably 70% to 95%, and more preferably 80% to 95% by weight of the total weight of the liquid composition.

Preferably the liquid composition includes, as a carrier and/or a cleaner, an aliphatic C_1 to C_4 alcohol, more preferably ethanol. Preferably the alcohol is present in an amount of 0.5 to 20%, more preferably 2 to 15%, most preferably 5 to 10% by weight of the total weight of the liquid composition.

The liquid composition may also include other optional ingredients which are well known to those skilled in the art, such as preservatives, for example chlormethylisothiazoline, 1,2 - benzisothiazolinone, buffering agents and fragrances.

The liquid composition may comprise a silicone compound but if so, it is preferably present in an amount by weight

of less than 5%, more preferably less than 2%, most preferably less than 0.5%, by weight of the total weight of the liquid composition. Most preferably the liquid composition does not comprise a silicone compound.

5

Suitably the liquid composition contains an anti-static compound, preferably an anti-static amphoteric compound.

10 The liquid composition may contain an anti-static agent and an amphoteric surfactant, as distinct components. Alternatively or additionally it may contain an amphoteric surfactant which has anti-static properties.

15 Suitable amphoteric surfactants which can be used in the cleaning composition include amphoteric betaine surfactants having anti-static properties.

A preferred, the amphoteric surfactant is an alkyl amino betaine or an alkyl amido betaine.

20

Suitable amphoteric surfactants also include cocoamides having anti-static properties, most preferably polyoxyethylene-3-cocoamide.

25 Suitable amphoteric surfactants also include imidazoline surfactants having anti-static properties, for example sodium capryloamphopropionate (CAS No. 68877-55-4).

30 Suitable amphoteric surfactants include lactamide surfactants having anti-static properties, for example Lactamide MEA (CAS No. 5422-34-4).

Particularly good anti-static results have been found with compositions containing a betaine in combination with a cocoamide.

5 Preferably, the anti-static compound is/are present in an amount (in total) from 0.05% to 10%, more preferably 0.1% to 5%, most preferably 0.1% to 2% by weight of the total weight of the cleaning composition.

10 Without being bound by any theory, it is believed that the water-resistance of a wooden surface may be compromised by silicone compounds, and/or by compounds used in their emulsification.

15 The sheet material may be any sheet material capable of carrying and delivering the liquid composition, and may be porous, absorbent and/or fibrous in structure.

Preferably the sheet material is a fibrous sheet material.

20

The sheet material could in principle be woven, but is preferably non-woven. For example, the sheet material may include non-woven sheet materials such as melt blown, coform, air-laid, bonded-carded web materials, hydro-
25 entangled materials and combinations thereof.

Preferably, the sheet material is a non-woven fibrous sheet material comprising synthetic and/or natural fibres. Most preferably, the non-woven fibrous sheet material
30 comprises viscose and/or rayon fibres.

Typically, the sheet material (dry) has a weight of from 20 to 80 grams per square metre (gm^{-2}), preferably 30 to

70gm⁻², most preferably 40 to 60gm⁻². A particularly preferred sheet material has a weight of approximately 50gm⁻².

- 5 Preferably, the wipe has a size in the range 10 to 40cm by 10 to 40cm, more preferably in the range 15 to 35cm x 15 to 35cm.

- 10 Preferably the loading of the liquid composition on the substrate is in the range of 30 to 150gm⁻², more preferably 50 to 100gm⁻².

- 15 Preferably, each individual wipe is loaded with 3.5 to 5.5g of the composition. Most preferably each wipe is loaded with approximately 5g of the composition. Advantageously, it has been found that this level of loading provides a wipe of size and grammage outlined above with sufficient moisture so that it does not dry out but it is not too wet to cause smearing in use.

20

In a particularly preferred embodiment each individual wipe has a size of approximately 20 x 30cm using a sheet material having a weight (dry) of 50gm⁻² and is loaded with about 5g of the composition.

- 25 According to a second aspect, the present invention provides a packaged product comprising a substantially airtight container having a resealable opening and containing a wipe of the first aspect.

- 30 The container could be a tub or a soft-pack in the form of a pouch (hereinafter a "wrap"). Preferably, the container includes a plurality of wipes which are arranged in a generally folded configuration in a stack so that each

wipe can be removed from the container one at a time. Such folded configurations well known to those skilled in the art and include C-folded, Z-folded, quarter-folded configurations and the like. Each wipe may be interfolded
5 with the wipe immediately above and below in the stack of wipes so that the action of withdrawing one wipe raises a part of the wipe underneath it, to assist its removal. Alternatively the wipes may rest on each other in a stack without being interleaved.

10 Alternatively, wipes could be wound as a roll and separated by perforated tear zones and the container could be a tub having an opening through which wipes are pulled.

According to a further aspect, the present invention provides the use of the wipe as defined hereinbefore for
15 cleaning a surface, for example of furniture. Preferably, the wipe is used to clean surfaces of glass, wood, plastics and the like. The benefit of the invention in resisting water stains is of primary value in relation to
wooden surfaces, by which term we include certain
20 lacquered or varnished wooden surfaces.

According to a still further aspect, the present invention provides a method of manufacturing a wipe as defined hereinbefore, the method comprising the steps of providing
25 a sheet material as defined hereinbefore and as part of the manufacture of the wipe moistening the sheet material with a liquid composition as defined hereinbefore.

Preferably, in the manufacturing method, a supply roll of sheet material is unwound to provide a continuously moving web of material. The web of material is saturated or
30 otherwise impregnated with the liquid cleaning composition

by any suitable means such as spraying, dipping, or the like as are well known to those skilled in the art. In a particular aspect, the web of material is passed over several perforated tubes which feed the solution into the

5 material.

In another embodiment a roll or stack of wipes is put in the container dry, and the liquid cleaning composition is injected into the container, to impregnate the wipes.

In one embodiment the web of material is slit in the machine direction into multiple ribbons, each of which may be folded into the type of fold desired for the individual wipe. The web of material is slit using a cutter, as is well known to those skilled in the art.

10

In a related method a wide roll of material is cut into a number of shorter rolls. A plurality of such shorter rolls are unwound at the same time. If wished the longitudinal edges of the unrolling webs (the edges parallel to the direction of unrolling) are folded over

15

against the central region of the webs. The unrolling webs are brought together in face-to-face manner and then cut at intervals, to form stacks ready to be packaged. In principle impregnation could be at any stage but in a preferred embodiment it is the individual unrolling webs which are impregnated, for example by spraying or dipping.

20

A resulting stack of wipes may be placed in a container, such as a plastics wrap or a tub, to provide a package of wipes. The container provides a substantially hermetically sealed environment for the wipes to minimise the escape of the liquid composition, by evaporation or otherwise.

25

The invention will now be described further with reference to the following non-limiting examples.

The following materials were used in the examples:

5

IMS 99 - ethyl alcohol, 96% pure, from IMS (Industrial Methylated Spirits)

Proxel GXL - a liquid preservative comprising 1,2-benzisothiazolinone and sodium hydroxide, from Avecia, UK

10 Ultralube E 342/45 - a water based anionic emulsion of paraffin wax, from Keim Additec, Germany

Rhodorsil EIP - a poly(dimethylsiloxane) which is pre-formulated with an anionic surfactant to form a slightly anionic oil-in-water aqueous emulsion having 35wt% of the

15 siloxane, and which is available from Rhodia Chemie, France.

The wipes were of highly tangled non-woven blend of natural and man-made fibres and are sold as DEXTER 12106,

20 by Alstrom-Dexter. The wipes were of grammage 50gm^{-2} , and

individual wipes were rectangles of size approximately $20\text{cm} \times 30\text{cm}$. The wipes were pre-moistened with the liquid cleaning compositions defined below. The loading of the

compositions was 5g per wipe. This was sufficient to

25 fully impregnate the wipes.

Wipes A were pre-moistened with Formula A below.

10

FORMULA A

Component	%w/w
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Deionized water	92.39
IMS 99	6.7
Ultralube E 342/45 Wax Emulsion	0.56
Prolemon Fragrance	0.2
Proxel GXL	0.15

Wipes B were of the same non-woven material impregnated
5 with Formula B, a control composition comprising the
following ingredients.

FORMULA B

Component	%w/w
Deionized water	91.55
IMS 99	6.5
Proxel GXL	0.15
Prolemon Fragrance	0.2
Sodium acrylate/acrylamide copolymer	0.3
Lactamide MEA	0.3
Rhodesil BIF	1.0

10 Wipes C were PLEDGE (RTM) cleaning wipes from SC Johnson.
These are believed to be impregnated with water, solvent
and approximately 7% wt/wt of silicone compound(s).

The effect of using Wipes A, B and C were also compared
15 with the effect of not wiping the surface to be tested.

The following procedure was used:

A sanded wooden surface painted black to aid visual assessment and with a shellac coating was prepared by
5 cleaning and drying until no moisture was present on the surface. A shellac coating was used as such surfaces are known to give white water stain marks when contacted with water for a prolonged period, and left untreated. The surface was marked such that it was divided into equal
10 rectangular sections, using masking tape. Different sections were tested either with Wipes A, B and C or without using a wipe. For sections tested by wiping with Wipes A, B and C the following protocol was used. Each section of the surface was wiped with a wipe by moving the
15 wipe up and down the rectangular section five times, then moving the wipe left and right across the rectangular section five times, ensuring complete coverage of the section. The sections that had been wiped were then left for 1 hour, before one millilitre of deionised water at
20 5°C was pipetted onto all of the rectangular sections, so as to form a small pool of water in the centre of each section. 100 ml glass beakers were then filled with 75 ml of tap water and one ice cube, and a beaker placed over each of the pools of water on each section of the surface,
25 ensuring that all the water was enclosed underneath the beaker.

The pools of water covered by the beakers were left for 7 hours, before the beakers were removed from the surface.
30 The remaining water on each of the sections was removed as follows: a clean dry dusting cloth was wrapped around a rubbing block and, using firm strokes, wiped on each section eight times in a downward direction, then a second

clean duster was wrapped around a rubbing block and wiped across each section eight times horizontally across each section. The surface was then left overnight (for a minimum of 16 hours) for any water stains to fully form.

5

The intensity of any water stains formed was evaluated by using the following method:

A panel of people using a blind scoring system was assembled. In the scoring system, 0 represented no staining and 4 represented severe staining of each rectangular section of the surface. Standard water staining marks were available for reference to the panel. The number of panellists was sixteen panellists per rectangular section tested, and each surface tested had two rectangular sections wiped by a Wipe A, two rectangular sections wiped by a Wipe B, and two rectangular sections wiped by a Wipe C, and two control rectangular sections which were not treated before the addition the water. Furthermore, two surfaces were tested in the above manner, to repeat the experiment.

In each evaluation of each rectangular section, it was ensured that each member of the panel was standing in exactly the same position, so the board was always viewed under the same lighting conditions.

The average of the experiments are shown in Table 1 below.

Test Method	Average Score - 0 to 4 (0 = no marking, 4 = severe watermarking)
Wipe A	0.66
Wipe B	1.24
Wipe C	3.34
Untreated surface	1.15

The results show that pre-treatment of a surface by wiping with pre-moistened Wipes A showed an excellent preventive effect in relation to water staining. The surface treated
5 with Wipes B, in which the composition contained a small loading of a silicone compound instead of a wax emulsion, showed a markedly lower effect than Wipes A in preventing white water stains, and slightly increased water staining compared with an untreated surface. Wipe C, believed to
10 have a much higher silicone loading, showed considerably increased water staining, in these tests.

CLAIMS

1. A moist wipe for cleaning a surface, the wipe comprising a sheet material pre-moistened with a liquid composition comprising a wax.
5
2. A moist wipe as claimed in Claim 1 wherein the wax is present as an emulsion in the liquid composition.
- 10 3. A moist wipe as claimed in Claim 1 or 2 wherein the wax is a paraffin wax.
4. A moist wipe as claimed in any preceding claim wherein the wax is present in the composition in an amount of
15 between 0.05% to 10% by weight of the total weight of the liquid composition.
5. A moist wipe as claimed in any preceding claim wherein the liquid composition is an aqueous composition which
20 includes water in an amount of 50% to 98% by weight of the total weight of the liquid composition.
6. A moist wipe as claimed in any preceding claim wherein the liquid composition includes, as a carrier and/or a
25 cleaner an aliphatic C_1 to C_4 alcohol.
7. A moist wipe as claimed in any preceding claim wherein the liquid composition comprises no silicone compound or a silicone compound in an amount of less than 5% by weight
30 of the total weight of the liquid composition.

15

8. A moist wipe as claimed in any preceding claim wherein the sheet material comprises a porous, absorbent and/or fibrous material.

5 9. A packaged product comprising a substantially airtight container having a resealable opening and a wipe as claimed in any preceding claim.

10 10. Use of a wipe as claimed in any of Claims 1 to 8 for cleaning a surface.

11. A method of manufacturing a wipe as claimed in any of Claims 1 to 8, the method comprising the steps of providing a sheet material and moistening the sheet material with a liquid composition comprising a wax.

12. A method as claimed in Claim 11 wherein a supply roll of sheet material is unwound to provide a continuously moving web of material.

20

13. A method as claimed in Claim 12 wherein the web of the material is slit to form perforated tear zones, or individual wipes in the form of a stack.

25 14. A moist wipe substantially as described herein.

15. A packaged product substantially as described herein.

30 15. A method of manufacturing a wipe substantially as described herein.

ABSTRACT

ARTICLE AND METHOD

The invention provides a moist wipe for cleaning a
5 surface, the wipe comprising a sheet material pre-
moistened with a liquid composition comprising a wax. The
wipe is used to wipe a surface, to effect a prophylactic
effect against water staining from subsequent contact on
the surface of water or aqueous liquid compositions. The
10 invention further provides a packaged product containing
at least one wipe and a method of manufacturing moist
wipes.